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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/763,651      | 01/23/2004  | Koichi Yoshikawa     | 450100-04890        | 8556             |

7590 07/11/2005

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EXAMINER


CHANG, AUDREY Y

| ART UNIT | PAPER NUMBER |
|----------|--------------|
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2872

DATE MAILED: 07/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

|                              |                               |   |  |
|------------------------------|-------------------------------|---|--|
| <b>Office Action Summary</b> | Application No.<br>10/763,651 | Applicant(s)<br>YOSHIKAWA ET AL.  |  |
|                              | Examiner<br>Audrey Y. Chang   | Art Unit<br>2872  |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 28 April 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) 7, 9-12 and 14 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6, 8 and 13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION*****Election/Restrictions***

1. Applicant's election with traverse of **species I (Figure 1)** in the reply filed on **April 28, 2005** is acknowledged. The traversal is on the ground(s) that applicant believes originally restricted species I (Figures 1-2) and species II (Figure 5) should be classified as the same species and originally restricted species III (Figure 6) and species IV (Figure 8) should be classified as the same species. This is not found persuasive because species I (Figures 1-2) and species II (Figure 5) are *mutually exclusive* from each other, and the species III (Figure 6) and species IV (Figure 8) are *mutually exclusive* from each other. Species I and III, as clearly shown in the figures are drawn to one *single* observation plane and the species II and IV are drawn to a plurality of observation planes. The following are the classification of claims that read on species I and II **respectively**.

Species I: claims 1-6, 8 and 13,

Species II: claims 1-7 and 13.

The requirement is still deemed proper and is therefore made **FINAL**.

2. Claims 7, 9-12, and 14 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected species, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on April 28, 2005.

3. Claims 1-6, 8 and 13 remain pending in this application.

***Claim Objections***

4. **Claims 1-6, 8 and 13 are objected to because of the following informalities:**

(1). The phrase "displaying N images of different viewing points" recited in claims 1 and 13 is confusing and indefinite since the phrase seems to describe the *images* being the viewing points. It is better to state such phrase as "N images that are viewable at N different viewing points respectively".

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(2). The phrase “arrival positions of rays of light whose direction remain unchanged by said light-condensing means do not coincide with said observing positions” recited in claims 1 and 13 are confusing and indefinite. It is really not clear what are these rays of light and how do they relate to the three-dimensional display apparatus.

(3). The phrase “said N viewing points” recited claims 1 and 13, is confusing and indefinite since it lacks proper antecedent basis from earlier part of the claims.

(4). The phrase “*a multiple hologram*” and the phrase “*a multi-layer hologram*” recited in claim 4 are confusing and indefinite. It is not clear what are these holograms? It is not clear if “a multiple hologram” means “a multiple of holograms”-- a plural number of holograms. In general a single hologram has a specific wavelength and angle selection property. In order for the hologram screen to direct image light from different directions to different observation points, the hologram needs to have a *plurality of holograms* that **each** directs one particular image light to one particular viewing points. Similarly, the phrase “a multi-layered hologram” is incorrect and it should be stated as “a multiple of holographic layers” or “a multiple of holograms stacked in a multi-layer structure” with the understanding that each holographic layer comprises a particular hologram.

(5). The phrase “said picture images” recited in claim 5 is confusing and indefinite since it lacks proper antecedent basis from its based claim.

**Appropriate correction is required.**

### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. **Claims 1-6, 8 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Kirk (PN. 5,379,133) in view of the patent issued to Malcolm et al (PN. 5,037, 166).**

**Kirk** teaches a *stereoscopic or three-dimensional image display* apparatus that is comprised of a *display means* having a plurality of *cathode ray tubes* (01-05, Figure 5) for displaying N images that are viewable at N different viewing points, (011-015), wherein the N different viewing points also serve as the N *observation points*. Kirk teaches that the images displayed by the display means are being formed at a *holographic integrated combiner screen* (92) that serves as the *light-condensing means* for *diffracting* the images formed on the screen to the N different observation points, (011-015), (please see column 8, line 7 to column 9 line 35). It is implicitly true that a hologram has wavelength and angle selectivity which means only the incident light on the particular hologram with the angle of incident and wavelength that match the particular angle and wavelength of the light used to record the hologram will be diffracted by the hologram to the observation point and the light rays that *do not* have the matching incident angle and wavelength will pass the hologram without being diffracted and therefore will not reach the observation point.

This reference has met all the limitations of the claims. Kirk teaches explicitly that the images displayed by the CRTs are being formed on the holographic screen, however it does not teach *explicitly* that an image forming means or lenses are being used to achieve such. But it is implicitly true that certain image forming means must be present to carry out the image-forming function in Kirk image display apparatus and lenses are typical image forming means in the optical art to form images on a screen. **Malcolm** et al in the same field of endeavor teaches explicitly to use a lens (129, Figure 6) to focus (namely forming) the image displayed by the CRT (101) on a holographic screen (102), (please see column 5, lines 10-20). It would then have been obvious to one skilled in the art to apply the teachings of

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**Malcolm et al** to use lenses as image-forming means, if not the case already, in the three-dimensional image display apparatus of Kirk to achieve the image forming function by simply lens means.

With regard to claim 2, Kirk teaches that the number of image is three or more, (please see Figure 5).

With regard to claim 3, Kirk teaches explicitly that the N images viewable from N different viewing points may be N images of the same object captured at N different viewing perspectives, (please see Figures 9-10).

With regard to claim 4, Kirk teaches that the holographic integrated combiner screen comprises a *number* of fringe patterns which means it comprises a plurality of holograms, (please see column 3, lines 17-26).

With regard to claims 5-6 and 8, Kirk teaches that the holographic integrated combiner screen *focuses* the images to the observation points (011-015) that are located at a *predetermined observation plane*. The observation plane is parallel to the holographic screen. Kirk also teaches that the gap between two or more of the observation points equal to a normal interpupillary distance of human eyes for stereoscopic image viewing to occur, (please see column 8, lines 50-65).

**7. Claims 1-6, 8 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Aritake et al (PN. 6,061,083) in view of the patent issued to Malcolm et al (PN. 5,037, 166).**

**Aritake et al** teaches a *stereoscopic or three-dimensional image display* apparatus (Figures 17 and 35) that is comprised of a *display device (302)* for displaying N images (#1 to #n) that are viewable at N different viewing points, (304-1 to 304-n or 1 to n), wherein the N different viewing points also serve as the *N observation points*. Aritake et al teaches that the images displayed by the display means are being formed at an image distribution part or parallel scanning part that may include *a multiple layers of*

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*holograms*, (please see layers 371, with hologram 374 in Figure 49) that serves as the *light-condensing means* for *diffracting* the images formed on the light-condensing means to the N different observation points, (1 to n), (please see column 21, lines 3-19 and column 27, lines 12-65). It is implicitly true that a hologram has wavelength and angle selectivity which means only the incident light on the particular hologram with the angle of incident and wavelength that match the particular angle and wavelength of the light used to record the hologram will be diffracted by the hologram to the observation point and the light rays that *do not* have the matching incident angle and wavelength will pass the hologram without being diffracted and therefore will not reach the observation point.

This reference has met all the limitations of the claims. Aritake et al teaches explicitly that the images displayed by the CRTs are being formed on the image distribution part or the holographic light-condensing means, however it does not teach *explicitly* that an image forming means or lenses are being used to achieve such. But it is implicitly true that certain image forming means must be present to carry out the image-forming function in Aritake et al image display apparatus and lenses are typical image forming means in the optical art to form images on a screen. **Malcolm** et al in the same field of endeavor teaches explicitly to use a lens (129, Figure 6) to focus (namely forming) the image displayed by the image display device (101) on a holographic screen (102), (please see column 5, lines 10-20). It would then have been obvious to one skilled in the art to apply the teachings of **Malcolm** et al to use lenses as image-forming means, if not the case already, in the three-dimensional image display apparatus of Aritake et al to achieve the image forming function by simply lens means.

With regard to claim 2, Aritake et al teaches that the number of image is three or more, (please see Figure 35).

With regard to claim 3, Aritake et al teaches explicitly that the N images viewable from N different viewing points may be N images of the same object captured at N different viewing perspectives, (please see Figures 60A).

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With regard to claim 4, Aritake et al teaches that the image distributing part or the parallel scanning part comprises a *multiple* of holographic layers, (please see Figure 49).

With regard to claims 5-6 and 8, Aritake et al teaches that the image distributing part focuses the images to the observation points (1-n) that are located at a *predetermined observation plane*. The observation plane is parallel to the image distributing part. It is implicitly true that the gap between two or more of the observation points equal to a normal interpupillary distance of human eyes in order for stereoscopic image viewing to occur, (please see column 21, lines 5-17).

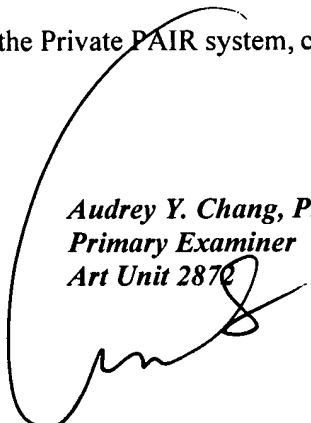
### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Audrey Y. Chang whose telephone number is 571-272-2309. The examiner can normally be reached on Monday-Friday (8:00-4:30), alternative Mondays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on 571-272-2312. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

**Audrey Y. Chang, Ph.D.**  
**Primary Examiner**  
**Art Unit 2872**



A. Chang, Ph.D.